

1. (Original) A probe card assembly comprising:

probe elements; and

a package coupled to the probe elements, wherein the package includes at least one die with active electronic components and at least one coolant port that allows a coolant to enter the package and directly cool the active electronic components of each die during a test operation.

2. (Original) The probe card assembly of claim 1, wherein the at least one coolant port allows liquid coolant to enter and exit the package.

3. (Original) The probe card assembly of claim 1, wherein the at least one coolant port allows gas coolant to enter and exit the package.

4. (Original) The probe card assembly of claim 1, wherein the at least one coolant port allows a combination of liquid and gas coolants to enter and exit the package.

5. (Original) The probe card assembly of claim 1, further comprising:

a cooling system; and

a coolant circulation system coupled between the cooling system and the at least one coolant port.

6. (Original) The probe card assembly of claim 1, wherein the package includes a bottom substrate and a top substrate coupled to one another by a seal to form a cavity.

7. (Original) The probe card assembly of claim 6, wherein the seal comprises an O-ring.

8. (Withdrawn) The probe card assembly of claim 1, wherein the probe elements are directly connected to the package.

9. (Original) The probe card assembly of claim 1, wherein the package includes a chamber and a bottom substrate coupled to form a cavity, and each die with active electronic components is coupled to the bottom substrate within the cavity such that the active electronic components face the bottom substrate.

10. (Original) The probe card assembly of claim 1, wherein the package further includes a bottom substrate and compliant interconnects, the compliant interconnects being coupled between each die and the bottom substrate.

11. (Original) The probe card assembly of claim 10, said compliant interconnects comprise spring contacts .

12-17. (Withdrawn) The probe card assembly of claim 11, said spring contacts comprise wirebond springs.

18. (Original) The probe card assembly of claim 1, wherein said at least one die comprises a plurality of dies.

19. (Original) The probe card assembly of claim 18, wherein said plurality of dies are arranged compactly within the package.

20-23. (Withdrawn)

24. (Currently Amended) A probe card assembly comprising:

a cooled package; and

a coolant circulation system that carries circulating coolant to and from said cooled package;

wherein the cooled package comprises at least one die coupled through compliant interconnects to the cooled package, and

wherein the at least one die has active electronic components that emit heat during a testing operation and the heat is transferred by the circulating coolant directly contacting the at least one die to transfer heat away from the active electronic components of each die during the testing.

25. (Original) The probe card cooling assembly of claim 24, wherein said compliant interconnects comprise spring contacts.

26-32. (Withdrawn)

33. (Currently Amended) A probe card cooling assembly, comprising:

means for sealing at least one die with active electronic components in a package;  
and

means for circulating coolant through the package to directly contact at least one die during operation of the active electronic components in testing to reduce thermal variations across each die.

34. (Withdrawn)

35. (New) The probe card assembly of claim 1, wherein the probe elements extend external to the package and are electrically connected to the at least one die within the package.

36. (New) The probe card assembly comprising:

probe elements; and  
a package coupled to the probe elements so that the probe elements extend external to the package, wherein the package includes at least one die with active electronic components electrically connected to the probe elements, and at least one coolant port that allows a coolant to enter the package and cool the active electronic components of each die during a test operation.